

WHAT IS CLAIMED IS:

1. An image processing apparatus comprising:
 - a first filter which is inputted with first image data which includes a plurality of pixels having respective pixel values and whose number of pixels should be converted to enhance or suppress a high frequency component of the inputted first image data to generate intermediate image data; and
 - a second filter which performs interpolation processing according to a linear interpolation method to the generated intermediate image data to generate second image data whose number of pixels is converted from the first image data.
2. The image processing apparatus according to claim 1, wherein the first filter generates the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value between adjacent pixels in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel position where the new pixel should be generated.
3. The image processing apparatus according to claim 2, wherein the first filter is inputted with a pixel number conversion information to determine the number of pixels in the first image data which is referenced for the convolution operation on the basis of the inputted conversion information.
4. The image processing apparatus according to claim 2, wherein the first filter is inputted with a pixel number conversion information to generate intermediate image data where the high frequency component in the first image data has been enhanced in the case of an enlargement processing, and generates intermediate image data where the high frequency component in the first image data has been suppressed in the case of a reduction processing.

5. The image processing apparatus according to claim 1, wherein the first filter generates the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value at pixel position of each pixel in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel in the first image data which corresponds to the new pixel.

6. The image processing apparatus according to claim 5, further comprising a determining section to determine an allowable range of each pixel value of interpolation pixels constituting the second image data on the basis of pixel values of pixels in the first image data corresponding to new pixels in the intermediate image data which are referenced for generating the each interpolation pixel by the linear interpolation method,

wherein the second filter restricts the pixel value of the interpolation pixel within the allowable range, in the case where the pixel value of the interpolation pixel exceeds the allowable range as the result of the interpolation processing.

7. The image processing apparatus according to claim 6, where the determining section determines a range defined by the maximum pixel value and the minimum pixel value of the pixels in the first image data corresponding to the new pixels in the intermediate image data as the allowable range.

8. The image processing apparatus according to claim 5, wherein the first filter is inputted with a pixel number conversion information to determine the number of pixels in the first image data which is referenced for the convolution operation on the basis of the inputted conversion information.

9. The image processing apparatus according to claim 5, wherein the first filter is inputted with a pixel number conversion information to generate intermediate image data where the high frequency component

in the first image data has been enhanced in the case of an enlargement processing and to generate intermediate image data where the high frequency component in the first image data has been suppressed in the case of a reduction processing.

10. The image processing apparatus according to claim 1, wherein the first filter selectively performs one of

- a first processing of generating the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value between adjacent pixels in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel position where the new pixel should be generated, and

- a second processing of generating the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value at pixel position of each pixel in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel in the first image data which corresponds to the new pixel.

11. An image processing method comprising:

- a first processing step of being inputted with first image data which includes a plurality of pixels having respective pixel values and whose number of pixels should be converted to enhance or suppress a high frequency component of the inputted first image data to generate intermediate image data; and

- a second processing step of performing interpolation processing according to a linear interpolation method to the generated intermediate image data to generate second image data whose number of pixels is converted from the first image data.

12. The image processing method according to claim 11, wherein the first processing step generates the intermediate image data where the high frequency component of the first image data has been enhanced or

suppressed by generating a new pixel having a pixel value between adjacent pixels in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel position where the new pixel should be generated.

13. The image processing method according to claim 11, wherein the first processing step generates the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value at pixel position of each pixel in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel in the first image data which corresponds to the new pixel.

14. An image processing system comprising:

an image data generating section which generates first image data which includes a plurality of pixels having respective pixel values and whose number of pixels should be converted;

a pixel number conversion section which enhances or suppresses a high frequency component of the inputted first image data to generate intermediate image data and performs interpolation processing according to a linear interpolation method to the generated intermediate image data to generate second image data whose number of pixels is converted from the first image data.; and

an image data processing section which processes the second image data.

15. The image processing system according to claim 14, wherein the pixel number conversion section generates the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value between adjacent pixels in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel position where the new pixel should be generated.

16. The image processing system according to claim 14, wherein the pixel number conversion section generates the intermediate image data where the high frequency component of the first image data has been enhanced or suppressed by generating a new pixel having a pixel value at pixel position of each pixel in the first image data, the pixel value of the new pixel being calculated by a convolution operation of pixel values of pixels positioned near the pixel in the first image data which corresponds to the new pixel.

17. The image processing system according to claim 16, wherein the pixel number conversion section determines an allowable range of each pixel value of interpolation pixels constituting the second image data on the basis of pixel values of pixels in the first image data corresponding to new pixels in the intermediate image which are referenced for generating the each interpolation pixel by the linear interpolation method, and restricts the pixel value of the interpolation pixel within the allowable range, in the case where the pixel value of the interpolation pixel exceeds the allowable range as the result of the interpolation processing.

18. The image processing system according to claim 14, wherein the image data processing section includes at least one of an encoding section for encoding the second image data generated by the pixel number conversion section and a display controller for controlling displaying the second image data on a display device.

19. The image processing system according to claim 14, wherein the image data generating section includes at least one of a decoder section for decoding encoded image data and an image taking-in section for taking in image data.